

Amendments to the Claims

Please cancel claims 122, 127, and 188-205 without prejudice.

The following listing of claims will replace all prior versions and/or listings of claims in the application:

Listing of Claims:

1-120. (cancelled)

121. (currently amended): A method for treating a hydrocarbon containing formation, comprising:

providing heat from one or more heaters to at least a portion of the formation, wherein at least one of the heaters is in ~~at least one an uncased portion of a wellbore in the formation, and wherein the uncased portion of the wellbore at least one of the wellbores~~ has been sized, at least in part, so that a minimum space between the heater and the formation is maintained after expansion of the formation in the wellbore caused by heating of the formation, based on a determination of expansion of the formation caused by heating of the formation such that expansion of the formation caused by heating of the formation is not sufficient to cause substantial deformation of one or more heaters in such sized wellbores, and wherein a ratio of an outside diameter of the heater to an inside diameter of the wellbore is less than about 0.75 and wherein the expansion of the formation in the wellbore is estimated based on the richness of one or more zones in the formation; and

allowing the heat to transfer from the one or more heaters to a part of the formation; and
producing a mixture from the formation.

122. (cancelled)

123. (currently amended): The method of claim 121, wherein the ~~ratio of the outside diameter of the heater to the inside diameter of the wellbore is less than~~minimum space is at least about 0.5 cm.

124. (currently amended): The method of claim 121, wherein the ~~ratio of the outside diameter of the heater to the inside diameter of the wellbore is less than~~minimum space is at least about 0.3 cm.

125. (currently amended): The method of claim 121, further comprising controlling the heating to maintain ~~a~~the minimum space between at least one of the heaters and the formation in at least one of the wellbores.

126. (original): The method of claim 121, further comprising controlling the heating using a temperature limited heater.

127. (cancelled)

128. (original): The method of claim 121, wherein a diameter of one or more of the sized wellbores is greater than or equal to about 30 cm.

129. (original): The method of claim 121, wherein one or more of the wellbores have an expanded diameter proximate to relatively rich zones in the formation.

130. (original): The method of claim 129, wherein one or more of the expanded diameters is greater than or equal to about 30 cm.

131. (original): The method of claim 129, wherein the relatively rich zones comprise a richness greater than about 0.15 L/kg.

132. (original): The method of claim 129, wherein the relatively rich zones comprise a richness greater than about 0.17 L/kg.

133. (original): The method of claim 121, further comprising adjusting a heat output of at least one of the heaters such that the heat output provided to relatively rich zones of the formation is less than the heat output provided to other zones of the formation.

134. (original): The method of claim 133, wherein the relatively rich zones comprise a richness greater than about 0.15 L/kg.

135. (original): The method of claim 121, further comprising adjusting a heat output of at least one of the heaters such that the heat output provided to relatively rich zones of the formation is less than about $\frac{1}{2}$ the heat output provided to other zones of the formation.

136. (original): The method of claim 121, further comprising reaming at least one of the wellbores after at least some heating of the formation from such wellbores.

137. (original): The method of claim 121, further comprising reaming at least one of the wellbores after at least some heating of the formation from such wellbores, and wherein the reaming is conducted to remove at least some hydrocarbon material that has expanded in such wellbores.

138. (original): The method of claim 121, further comprising removing at least one of the heaters from at least one of the wellbores, and then reaming at least one such wellbore.

139. (original): The method of claim 121, further comprising perforating one or more relatively rich zones in at least part of the formation to allow for expansion of at least one or more of the relatively rich zones during heating of the formation.

140. (original): The method of claim 121, further comprising placing a liner in at least one of the wellbores, between at least a part of one of the heaters and the formation, wherein the liner inhibits heater deformation caused by thermal expansion of the formation during heating.

141. (original): The method of claim 140, wherein the liner comprises a mechanical strength sufficient to inhibit collapsing of the liner proximate relatively rich zones of the formation.

142. (original): The method of claim 140, wherein the liner comprises one or more openings to allow fluids to flow through the wellbore in which the liner is placed.

143. (original): The method of claim 140, wherein a ratio of an outside diameter of the liner to the inside diameter of the wellbore in which the liner is placed is less than about 0.75.

144. (original): The method of claim 140, wherein a ratio of an outside diameter of the liner to the inside diameter of the wellbore in which the liner is placed is less than about 0.5.

145. (original): The method of claim 140, wherein a ratio of an outside diameter of the liner to the inside diameter of the wellbore in which the liner is placed is less than about 0.3.

146. (original): The method of claim 121, further comprising maintaining a temperature in at least a portion of the formation in a pyrolysis temperature range, with a lower pyrolysis temperature of about 250 °C and an upper pyrolysis temperature of about 400 °C.

147. (original): The method of claim 121, further comprising heating at least a part of the formation to substantially pyrolyze at least some hydrocarbons in the formation.

148. (original): The method of claim 121, further comprising controlling a pressure and a temperature in at least a part of the formation, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure.

149. (previously presented): The method of claim 121, wherein allowing the heat to transfer from the one or more heaters to the part of the formation comprises transferring heat substantially by radiation.

150. (original): The method of claim 121, wherein the produced mixture comprises condensable hydrocarbons having an API gravity of at least about 25°.

151. (original): The method of claim 121, further comprising controlling a pressure in at least a majority of a part of the formation, wherein the controlled pressure is at least about 2.0 bars absolute.

152. (original): The method of claim 121, further comprising controlling formation conditions such that the produced mixture comprises a partial pressure of H₂ in the mixture greater than about 0.5 bars.

153. (original): The method of claim 121, wherein the formation comprises an oil shale formation.

154. (original): The method of claim 121, wherein the formation comprises a coal formation.

155-1690. (cancelled)

1691. (new): A system configured to heat at least a part of a hydrocarbon containing formation, comprising:

an elongated heater located in an uncased opening in the formation, wherein the heater is configured to provide heat to at least a part of the formation during use such that at least a part of the formation is heated to at least about 250 °C; and

wherein the opening has been sized so that a minimum space between the heater and the formation is maintained after expansion of the formation in the wellbore caused by heating of the formation, and wherein the expansion of the formation in the wellbore is estimated based on

richness of one or more hydrocarbon layers.

1692. (new): The system of claim 1691, wherein the minimum space is at least about 0.5 cm.

1693. (new): The system of claim 1691, wherein the minimum space is at least about 0.3 cm.

1694. (new): The system of claim 1691, wherein a diameter of the wellbore before heating is greater than or equal to about 30 cm.

1695. (new): The system of claim 1691, wherein the richness of one or more hydrocarbon layers is greater than about 0.15 L/kg.

1696. (new): The system of claim 1691, wherein the richness of one or more hydrocarbon layers is greater than about 0.17 L/kg.

1697. (new): The system of claim 1691, wherein the elongated heater is a temperature limited heater.

1698. (new): The system of claim 1691, further comprising a liner in at least one of the wellbores between the heater and a rich hydrocarbon layer.

1699. (new): The system of claim 1691, further comprising a liner in at least one of the wellbores between the heater and a rich hydrocarbon layer, wherein the liner includes one or more openings through a wall of the liner.

1700. (new): The system of claim 1691, wherein the formation comprises an oil shale formation.

1701. (new): The system of claim 1691, wherein the formation comprises a coal formation.

1702. (new): A method for treating a hydrocarbon containing formation, comprising:
providing heat from one or more heaters to at least a portion of the formation, wherein at least a portion of one of the heaters is in an uncased wellbore in the formation;
adjusting a heat output of at least one of the heaters such that the heat output provided to relatively rich zones of the formation is less than the heat output provided to other zones of the formation so that a minimum space between the heater and the formation is maintained after expansion of the formation in the wellbore caused by heating of the relatively rich zones, and wherein the expansion of the formation in the wellbore is estimated based on the richness of the relatively rich zones in the formation;
allowing the heat to transfer from the one or more heaters to a part of the formation; and
producing a mixture from the formation.

1703. (new): The method of claim 1702, wherein the minimum space is at least about 0.5 cm.

1704. (new): The method of claim 1702, wherein the minimum space is at least about 0.3 cm.

1705. (new): The method of claim 1702, wherein at least one of the heaters is a temperature limited heater.

1706. (new): The method of claim 1702, wherein a diameter of at least one wellbore before heating is greater than or equal to about 30 cm.

1707. (new): The method of claim 1702, wherein the richness of the relatively rich zones is at least about 0.15 L/kg.

1708. (new): The method of claim 1702, wherein the richness of the relatively rich zones is at least about 0.17 L/kg.

1709. (new): The method of claim 1702, wherein the heat output provided to the relatively rich zones is less than about one half of the heat output provided to the other zones.

1710. (new): The method of claim 1702, further comprising reaming at least one of the heater wellbore after at least some heating of the formation.

1711. (new): The method of claim 1702, further comprising removing a heater from a wellbore after the some heating of the formation from the heater, reaming the wellbore, and placing the heater back in the wellbore.

1712. (new): The method of claim 1702, further comprising placing a liner between at least a part of one of the heaters and the formation.

1713. (new): The method of claim 1702, further comprising placing a liner between at least a part of one of the heaters and the formation, wherein the liner includes one or more openings in a wall of the liner.

1714. (new): The method of claim 1702, wherein allowing the heat to transfer from the one or more heaters to the part of the formation comprises transferring heat substantially by radiation.

1715. (new): The method of claim 1702, wherein the produced mixture comprises condensable hydrocarbons having an API gravity of at least about 25°.

1716. (new): The method of claim 1702, further comprising controlling formation conditions such that the produced mixture comprises a partial pressure of H₂ in the mixture greater than about 0.5 bars.

1717. (new): The method of claim 1702, wherein the formation comprises an oil shale formation.

1718. (new): The method of claim 1702, wherein the formation comprises a coal formation.